tyNorth Pole Refinery Technical Project Team
December 14, 2010
ADEC Fairbanks Offices - First Floor Conference Room
610 University Avenue
Fairbanks, AK

Technical Project Team Members in Attendance

Bill Butler	City of North Pole, Director of City Services
Dr. Dave Barnes	UAF, Department Chair, Civil and Environmental Engineering
Cindy Christian	DEC, Drinking Water Program, Compliance Program Manager
Mark Coggeshall	Flint Hills Resources, Project Manager
Ann Farris	DEC, Contaminated Sites Program, Project Manager
Rich Sundet	DEC, Contaminated Sites Program, Manager
Nim Ha	DHSS, Acting Program Manager, EPHP (via telecon)
Brian Jackson	DEC, Prevention and Emergency Response Program (PERP)
Lee Johnson	DEC, Drinking Water Program
Dr. Cassie Kirk	DHSS, Environmental Toxicologist, EPHP
Elizabeth Page	Reiss Remediation
Brandon Perkins	EPA, Region 10 (via telecon)
Jeanne Swartz	DEC, Industry Preparedness Program (IPP)
Shannon Price	Flint Hills Resources Alaska, Consultant

Support Personnel in Attendance

Rebecca Andresen	Arcadis
Stephanie Buss	SPB Consulting, Toxicologist
Todd Dejournett	Barr Engineering (via telecon)
Brian Angerman	Barr Engineering (via telecon)
Denise Elston	DEC, Contaminated Sites Program, Program Specialist
JoAnn Grady	Grady and Associates, Team Facilitator
Johnny Mendez	DEC, Drinking Water Program, Environmental Engineer
Lisa Minnear	OASIS Environmental, Project Manager
Meg Michell	Environmental Standards, Inc. (via telecom)
Dave Verbrugge	Department of Health and Social Services, Chemist (via telecom)
Kim Specman	DEC, Wastewater Compliance Officer
Eric Zentner	OASIS Environmental, Asst. Facilitator

INTRODUCTIONS AND DISCUSSION OF MEETING AGENDA

The meeting began at 9:00 AM as team members introduced themselves and briefly discussed and approved the team's agenda for the meeting. The team reviewed the completion status of action items

from the previous TPT meeting. The team determined that most of the action items had been completed. In regard to Action Item 10, Ms. Page said that information concerning the monitoring wells located in the area northeast of the refinery between the refinery and the A well would be included in the Site Characterization Report. With regard to Action Item 12, Ms. Buss said that the Chemistry Subgroup is currently evaluating the SOP's for water and soil sampling.

THE EPA PRELIMINARY ASSESSMENT

Mr. Perkins presented an update on the status of the EPA's ongoing assessment of whether the project site is eligible for designation under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Mr. Perkins informed the team that the department is currently waiting for the results of other investigations that may affect its assessment. He explained that there are certain regulatory provisions that exclude sites that have been contaminated by petroleum or petroleum waste from designation under CERCLA. He said that the department is trying to determine whether the exemptions to these provisions apply to this particular site.

Mr. Perkins said that the DEC is also currently working with the EPA risk assessors to develop a Provisional Peer Reviewed Toxicity Value (PPRTV) document based on a review of all the information that is publically available on sulfolane. He said that while there is no guarantee that they will find any additional information that affects their assessment of the site, there is a potential that the PPRTV process may establish a benchmark value, which would, in turn, be used to develop a Hazard Ranking System (HRS) score for the site. Groundwater and soil cleanup values would then be calculated from the PPRTV benchmark. Mr. Perkins said that he would contact EPA's Region 10 Headquarters to determine the timeline for the EPA's development of the PPRTV and relate this information back to the TPT.

ACTION ITEM: Mr. Perkins will contact EPA Region 10 headquarters and inquire about the timeline for the development of the HRS for the North Pole Refinery. He will relate any information on the timeline of the investigation for the TPT.

The team discussed some of the possible implications of the PPRTV process. Ms. Farris expressed her concern that the different agencies involved in the project may have different interpretations of a very limited data set. She said that she hopes that the team makes it a priority to work with the EPA and other entities to determine how to fund and coordinate additional research to address the limitations of the existing research on sulfolane.

The team deliberated on the possible outcomes of the CERCLA HRS process. Mr. Perkins and Ms. Farris informed the team that there are several possible alternative scenarios for the organization of the project's leadership if the HRS qualifies the site for possible listing on the National Priorities List (NPL). They said, for example, the state could take the lead on the project while working with the EPA, or the State could enter into a formal agreement in which it takes the lead regardless of whether the site is listed on the NPL.

THE ATSDR EVALUATION

Ms. Kirk gave a brief overview of the status of the ongoing ATSDR evaluation of the public health action level for sulfolane. She said that, at this point, ATSDR has yet to send Mr. Durant's report out for external review. Mr. Durant informed her that the MRL work group agreed with his assessment and did not change the action level of 25 ppb. She said that she is still waiting for an informal recommendation on how to address the data gaps in the toxicology study, but she has discussed the issue with Mr. Durant who believes that a chronic toxicity study would probably be the best approach. She said that she thought that the external review of the report may be complete by the end of January.

TOXICOLGY AND CHEMISTRY SUBGROUP

Ms. Buss updated the team on recent development within the Chemistry and Toxicology Subgroups. The Chemistry Subgroup is currently developing performance criteria to present to the labs to ensure standardized analysis for sulfolane in all media, water, soil, plant tissue, etc. Mr. Verbrugge said that he has nearly completed a key elements document that defines the aforementioned performance criteria. He briefly outlined the content of the document and described some of the considerations that were taken into account as it was drafted. He said that he hoped to have a skeletal version of the document finished by the end of the day. The Chemistry Subgroup will review the key elements document once it is complete. She said that the subgroup has scheduled a meeting for the 22nd of December to finalize the document and present it to the labs.

The team discussed various considerations associated with the development of the proposed standards. Dr. Barnes asked whether the extraction procedure applied to vegetable samples would be different than that used for the groundwater samples. Mr. Verbrugge replied that the procedure for vegetable samples will be somewhat different in that some preprocessing is required to homogenize the samples. Given the concerns about the efficiency of the extraction of sulfolane from vegetables, the procedure for vegetable sampling should be thoroughly reviewed to ensure that the efficiency of the extraction process is known before the team proceeds with a formal greenhouse study, particularly if that study involves any procedure in which test samples are spiked with sulfolane.

STATUS OF THE GARDEN REPORT AND THE GARDEN RESULTS FACT SHEET

Ms. Ha and Ms. Buss updated the team on the status of the Garden Sampling Report and the Garden Results Fact Sheet. The draft of the Garden Sampling Report should be ready for internal review by the end of the week and for team review by the end of the year. The format of the Garden Results Fact Sheet will be similar to the prior fact sheet on the early sample results. It presents the concentrations of sulfolane found in plant and ground water samples but does not link plant samples with water samples. The fact sheet includes a section that describes the screening levels for infants and adults and it reiterates the department's position that while the results do not suggest any health concerns, the department, in light of the scarcity of information available on sulfolane, cannot draw broad conclusions for all gardeners about the safe use of sulfolane-affected water for growing fruits and vegetables. The report also includes a discussion of the TPT and possible future steps that may be taken to address the general lack of information available on sulfolane.

The team discussed concerns raised by various members that, given the limited scope of the study, DHSS' recommendation may cause undue apprehension among affected residents. Ms. Ha replied that she feels that the fact sheet adequately describes the limitations of the data and provides the appropriate recommendation given these limitations. Ms. Ha agreed to present representatives of FHRA with a copy of the fact sheet and to provide them with an opportunity to make suggestions to the department before the fact sheet is released to the public.

The team continued discussing the limitations of the garden sampling. Ms Farris remarked that the team needs to discuss the data gaps and the general steps that it should take to address them, whether it is a chronic toxicity study, a greenhouse study, or some other approach. The team agreed it should take further steps to investigate the possibility of conducting a more controlled greenhouse study. Dr. Barnes offered to contact pertinent staff members at the University of Alaska Fairbanks (UAF) and the local offices of the United States Department of Agriculture (USDA) to discuss the possibility of contracting with those institutions to participate in a greenhouse study.

ACTION ITEM: Dr. Barnes will contact pertinent staff members at UAF and the USDA to discuss the possibility of contracting with those institutions to participate in the proposed greenhouse study.

The team further deliberated on considerations and concerns associated with the potential greenhouse study. Ms. Farris commented that it imperative that the Chemistry Subgroup complete its standardized SOPs as soon as possible if the study is to be conducted in the upcoming season. She expressed her concern that due to time constraints, it may no longer be possible for the department to take the lead on the project and that it may have to be managed by FHRA. The team discussed the concern of whether it would be prudent to proceed with the study without addressing gaps in the toxicology data. The team agreed that while certain questions may remain outstanding, a greenhouse study would at least give the team confidence in the worst case scenario. The team agreed to schedule a meeting of the Toxicology Subgroup to discuss who will lead the project, the project's timeline, and other pertinent considerations.

STATUS OF THE DEVELOPMENT OF THE IN-HOME TREATMENT SYSTEM

Ms. Page presented an update of the status of development of the In-Home (or Entry-point) Treatment System. Recent bench testing performed with carbon activated with coconut speaks well for efficacy of the carbon-based treatment option. Developers performed additional testing to determine the plausibility of adding a UV-peroxide component to the system but FHRA has decided that it will not pursue the development of that option due to complexities that are associated with it. Mr. Dejournett and Mr. Coggeshall described the procedures and calculations underlying recent bench testing associated with the system's development. Testing consisted of two key components, a measurement of the residence time of sulfolane in the adsorption column and a determination of the adsorptive capacity of carbon. Based on extrapolation from the results of the testing, the designers believe that a full scale system applied to a well with a sulfolane concentration of 320 ppb could provide clean water

for a family of four using 60 gallons per person per day for between four to five months before any sulfolane breakthrough would be expected.

The team discussed information that was presented on the treatment system. The team offered various suggestions for FHRA to consider as it continued to develop the system. Mr. Mendez suggested that the developers take into account how varying levels of organic and mineral content in water from residential wells might affect the system's performance. The team discussed the possibility of securing 3rd party verification testing for the in-home treatment system. Mr. Coggeshall said that FHRA supports the notion of 3rd party verification and added that they would continue to look into the possibility of incorporating 3rd party verification into the system's development process.

ACTION ITEM: Representatives of FHRA will follow up on the possibility of securing 3rd party verification testing for the in-home treatment system.

THE ADSORBTION STUDY

Ms. Page presented an overview of the objectives and methodology of the Adsorption Study. She emphasized that the study's findings will help the team to better understand the fate and transport of sulfolane by demonstrating how its concentration changes through the absorption and dilution process.

SITE CHARACTERIZATION

Ms. Page presented an overview of the delineation efforts that have been conducted since investigation of the site began in October of 2009.To this date, FHRA has installed 74 dissolved phase delineation wells. Four Light Non-Aqueous Phase Liquid (LNAPL) wells and 38 delineation wells have been installed since the work plan has been approved. She believes that the delineation of the shallow plume is now complete and FHRA is close to completing the delineation of the vertical plume.

Ms. Page discussed a slide on the specifications of the new wells that were installed according to the work plan. She explained how information such as the location of the well, the well type, the depth to permafrost, and other dimensions of the well were represented on the slide. She remarked that her only outstanding concern with regard to the delineation is how they are going to close the data gap that was intended to be addressed by the original location for MW-188 which could not be completed due to permafrost. Monitoring well MW-188 was installed, but it is more than 1 mile downgradient from the next closest well (due to the presence of permafrost and other access limitations). The team discussed the delineation of LNAPL plume. Ms. Page remarked that they are beginning to monitor the LNAPL wells on a weekly basis and they are getting a good idea of where the LNAPL contamination is located. FHRA intends to include some estimates of the amount of LNAPL contamination in the Site Characterization Report.

Ms. Page presented a slide on recent improvements that have been made to the project's electronic data delivery system. The system is an access database with a GIS component. Shannon & Wilson will

upload the most recent project data to a thumb drive as soon as it has been reviewed through their quality assurance process and deliver the drive to the DEC every month.

At this point the database only has groundwater data, but it is currently being updated to house additional media. Eventually the database will be able to accommodate all of the media that is analyzed during the project. It is estimated that an updated version of the database should be ready by the end of February. Denise Elston of the DEC said that by February, she would provide Shannon & Wilson with the list of queries DEC would like to have included in the database.

ACTION ITEM: By the end of February**,** Ms. Elston will provide representatives of Shannon & Wilson with the request for queries that the DEC would like to have included in the database.

Ms. Page introduced slides outlining measures that FHRA intends to implement to improve the way the project data are reported. She briefly reviewed the minimum reporting requirements stipulated by the DEC for weekly, monthly, and semi-annual reports and described various ways that FHRA intends to improve the way it currently fulfills these requirements. She described at length various changes that FHRA intends to make to its groundwater reports, including changing to a quarterly format as proposed in the Site Characterization Work Plan. A detailed outline of the new report format was presented and discussed. Ms. Page emphasized that she considers the first quarterly report to be a test and that she expects that FHRA will make ongoing refinements to the format of the report per DEC suggestions.

The team discussed changes that have been proposed to improve the way that project information is reported. Ms. Farris remarked that since the Site Characterization Report (SCR) - due in May - will contain all of the information listed in the outline for the first quarterly report - due in April - it may be prudent simply to ensure that all of the information intended for the first quarterly report is included in the SCR and skip the submittal of a Quarterly Report in April. She said that, at any rate, she would take a look at the outline of the quarterly report and determine whether to approve it as a template for future reports.

Ms. Page provided a brief overview of the fate and transport model for the site. The model will include a complete account of the fate and transport of sulfolane as well as the Ground Penetrating Radar (GPR) data that have been collected over the course of the site characterization. Ms. Page said that the model will be based on the Finite Element Subsurface FLOW System (FEFLOW) as opposed to the Modular Finite Difference Flow Model (MODFLOW) which was initially proposed. Mr. Farris asserted that FHRA should document their decision to use FEFLOW in the place of MODFLOW since it represents a departure from the work plan.

ACTION ITEM: Ms. Page will contact Ms. Farris and Ms. Minnear to discuss various assumptions within the sites fate and transport model.

THE SUMP REPORT

Ms. Page informed the team that the sump report was submitted to Mr. Jackson last week and they are currently waiting for his response. She said that Mr. Knowles is working with the lab manager to try to determine the location of the electrical conduits in the lab so they can proceed to drill into the lab's subsurface area to collect the samples that the DEC has requested. Ms. Page commented that the previous estimate of the volume of the potential spill was an absolute worst case scenario that did not reflect the true conditions under which the drains were used. Ms. Page added that FHRA is currently reassessing the calculation of the volume of the potential release. She said that she expected that it would take them a couple weeks to reassess the calculation of the estimated volume of the potential release, and they could provide this information in response to any review comments that Mr. Jackson may have on the report.

ACTION ITEM: Ms. Page will provide Ms. Farris with an estimate of the timeline of the investigation into the lab drain system at the North Pole Refinery.

ACTION ITEM: Ms. Page will provide Mr. Perkins with a copy of recent reports related to the investigations performed around the FHRA laboratory.

SOIL SAMPLING

The team took up discussion of the soil sampling efforts that have been conducted throughout the project. Ms. Page remarked that sulfolane was not found in sediment samples taken during the installation of project wells. The team agreed that the results of such sampling, although informal, are consistent with the existing literature on sulfolane which suggests that it does not readily adhere to soil.

SOURCE REMEDIATION

Ms. Page presented a slide defining "source" as spills or leaks into the subsurface that result in LNAPL contamination, dissolved groundwater contamination, or contaminated soil. She reiterated that while FHRA acknowledges that some minor releases have occurred since they took ownership of the facility, the bulk of the project is concerned with remediating historical releases.

Ms. Page gave a brief overview of the status of the development of the remediation system. She presented a slide of an aerial photo showing completed and forthcoming improvements to the remediation system such as an additional recovery well and related observation wells, the LNAPL removal system, and improvements to the system's piping. She related increases in various performance measures for the system such as the rate of product recovery and suggested that this may be due to the recent improvements that have been made to the system.

THE DRINKING WATER SUBGROUP

The team reviewed the results of the ongoing sampling of residential wells in or around the plume area, the progress on the development of the new municipal wells, and the development of the in-home

treatment system. Mr. Coggeshall informed that team that as of December 7th, FHRA has visited 824 locations and sampled 456 wells. He said that 131 showed concentrations of sulfolane greater than 25 parts per billion (ppb), 64 showed concentrations between 10 and 25 ppb, and 261 of the sampled wells did not have a detectable concentration of sulfolane above the 10 ppb reporting limit. He added that FHRA is waiting on the results of 6 additional wells. Mr. Coggeshall said that FHRA is currently providing bottled water at 320 locations and has connected city water at 29 locations. FHRA installed six bulk water tanks at four locations and one frac tank at Hawk's Greenhouse.

Mr. Coggeshall presented a slide showing a map of the plume area with the results of water sampling that has been conducted in the area up to November 30th. Mr. Butler commented that the mixture of detect and non-detect wells in a particular location is probably the result of variance in the depth the wells in that location. Mr. Coggeshall added that the lack of information on the depth of many of the wells in the plume area has been an issue throughout the project. Ms. Christian suggested that the department may have records on the depth of some of the wells in the area and offered to provide this information to the TPT if it is available.

ACTION ITEM: Ms. Andresen will contact ADEC to determine whether they have files on the depths of certain residential wells located in or around the plume area.

Mr. Coggeshall presented a brief overview of the design specifications of the proposed municipal water well and an update on its current status within the construction process. FHRA believes that the system will be operational and substantially completed by January 5th, 2011. Mr. Coggeshall described the results of recent aquifer testing. Results of water quality tests were as good as or better than those of the existing municipal wells. FHRA intends to send additional water samples to the state lab since it has the lowest detection limits for sulfolane and it has recently come back online.

ACTION ITEM: Mr. Coggeshall will relay to ADEC the results of the analysis of samples sent to the state lab as part of their proposed sampling program.

Mr. Coggeshall presented a slide showing recent revisions that FHRA has made to its model of the sidegradient capture zone in light of recent aquifer testing data. As a precaution, the new model reflects an analysis incorporating two different assumptions concerning the amount of permafrost in the area, one that there is no permafrost in the area, and the other, a conservative scenario in which the entire area contains permafrost. He reiterated that the results of the more extreme assumption were incorporated into the model as a precautionary measure.

Mr. Coggeshall presented a basic schematic diagram of the new municipal wells and a summary of their performance specifications. He said that FHRA is currently working on a document that demonstrates the results of tests performed on the new municipal wells to determine their pump rate, constant rate, flow rate, average drawdown, specific capacity, and sand content. The document will also show the aquifer response and the observation well drawdown that was measured while the new wells were being tested.

Mr. Coggeshall summarized the status of the project within the approval processes of various regulatory agencies. He listed various requirements that are still outstanding and mentioned that he was recently informed by the Department of Natural Resources (DNR) that their approval of the final water rights application would be delayed since the department is currently backlogged.

The team briefly discussed the status of the monitoring wells located near the new municipal wells. Mr. Mendez requested that Mr. Coggeshall provide him with a copy of the drill logs and other information needed to demonstrate that the monitoring wells located near the new municipal wells have been properly constructed.

ACTION ITEM: Mr. Price will provide Mr. Mendez with a copy of the drill logs and other information needed to demonstrate that the monitoring wells located near the new municipal well have been properly constructed.

THE RISK COMMUNICATION SUBGROUP

Ms. Grady updated the team on recent developments within the Risk Communication Subgroup. The subgroup recently approved the final version of team's new communication plan. The new communication plan outlines how communications will be conducted between the TPT and the public, provides for the addition of an on-line survey to the project's website, specifies certain revisions to the format of the team's newsletter, and it suggests various ways to expand and improve the format of the team's open house meetings.

Mr. Coggeshall briefly updated the team on recent message points that FHRA has discussed with affected residents. FHRA intends to direct its communication efforts towards one-on-one discussions with affected well owners as it continues to develop the in-home treatment system and other alternative solutions. Teams conducting this outreach will consist of technical and public relations personnel who will walk the residents through the options that are available to them. They will discuss agreements, and, perhaps, offer advice regarding which option may best fit a particular situation. FHRA is not planning to host any public meetings in the near future, but they may host a community workshop to provide information on how to use water efficiently.

WRAP UP

The team discussed the schedule for the following TPT meeting. The team agreed to convene for the next TPT meeting on February 16th, 2011. The team tentatively agreed to schedule the following TPT meeting for March 17th, 2011.

The meeting adjourned at 4:30 PM Alaska Time.